electric source comprising:

a rectifier configured to rectify alternating-current; and

an oscillator configured to generate alternating-current from the rectified alternating-current.

REMARKS

Favorable consideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-13 are presently pending in this application, Claims 1, 7, 11, and 12 having been amended and Claim 13 having been added by the present amendment.

In the outstanding Office Action, Claim 7 was objected to because of informalities; Claims 1, 4, 11 and 12 were rejected under 35 U.S.C. §102(b) as being anticipated by Burns et al. (U.S. Patent 3,962,606); Claims 2, 3, 5 and 7-10 were rejected under 35 U.S.C. §103(a) as being unpatentable over Burns et al; and Claim 6 was objected to as being dependent upon a rejected base claim. However, Claim 6 was indicated as being allowable if rewritten in independent form.

Amended claims and new claims are fully supported by the specification, claims and drawings as originally filed.[1] Applicants therefore submit that no new matter has been introduced.

Independent Claim 13 substantially corresponds to Claim 6, which was indicated as being allowable if rewritten in independent form. Therefore, Claim 13 is believed to be allowable.

In response to the objection to Claim 7, Claim 7 has been amended to correct the

[1]For example, page 7, lines 4-6 of the present specification.

formalities of the claim. The amendment to Claim 7 is not believed to narrow the scope of the claim. If, however, the Examiner disagrees, the Examiner is invited to telephone the undersigned who will be happy to work in a joint effort to derive mutually satisfactory claim language.

Briefly recapitulating, Claim 1 is directed to a ground fault interrupter. For example, referring to the non-limiting embodiment of Fig. 1, the ground fault interrupter includes a switch 4, a zero-phase current transformer 5, a detection resistor 6, a controller 8, and at least one filter 7. The zero-phase current transformer 5 is configured to detect unbalanced current flowing in the electric lines 2. The detection resistor 6 is connected in parallel to the zero-phase current transformer 5 and configured to convert current outputted from the zero-phase current transformer 5 to voltage. The controller 8 is configured to determine based on the voltage of the detection resistor 6 whether an electric leak occurs and configured to open the switch 4 when the controller 8 determines that an electric leak occurs. The filter 7 is provided between the detection resistor 6 and the controller 8 and configured to remove high frequency elements in the voltage of the detection resistor 6. The filter 7 includes a capacitor 10 which is connected in parallel to the controller 8 and an input side resistor 9 which is connected in series to the controller 8 and which is configured to limit current input to the controller 8. The ground fault interrupter does not include a clipping circuit between the zero-phase current transformer 5 and the controller 8.

A conventional ground fault interrupter includes a clipping circuit. In this conventional ground fault interrupter, the electric leak determination unit determines that electric leak occurs when the electric leak detection circuit receives a high frequency signal even though the ground fault does not actually occur. Consequently, when the load is an inverter device, the conventional ground fault interrupter including a clipping circuit

unnecessarily opens the switch.[2]

According to the present invention recited in Claim 1, the ground fault interrupter does not include a clipping circuit between the zero-phase current transformer and the controller. Instead, the ground fault interrupter includes a filter which includes a capacitor and an input side resistor. Thus, even when the load is a high capacity inverter device, the ground fault interrupter according to the present invention prevents the switch from opening due to a malfunction caused by a high frequency electric leak.[3]

The Office Action asserts that Burns et al. discloses a detection resistor (R1), the input side resistor (R3) and a capacitor (C4). However, Burns et al. fails to disclose that the ground fault interrupter does not include a clipping circuit between the zero-phase current transformer and the controller. Burns et al. discloses a clipping circuit which includes the diodes (D1 and D2). Therefore, as described above, when the load is an inverter device, the Burns et al. ground fault interrupter unnecessarily opens the switch. Thus, Burns et al. is not believed in any way to anticipate the specific structure recited in Claim 1. Therefore, Claim 1 is believed to be allowable.

Likewise, independent Claims 11 and 12 include subject matter substantially similar to what is recited in Claim 1 to the extent discussed above. Thus, Claims 11 and 12 are also believed to be allowable.

Substantially the same arguments as set forth above with regard to Claim 1 also apply to dependent Claims 2-10, which depend directly or indirectly from Claim 1, respectively. Accordingly, each of dependent claims is also believed to be allowable.

Consequently, in view of the present amendment and in view of the indication of

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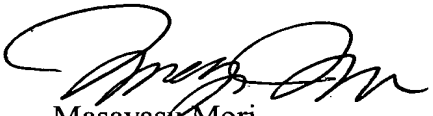
[2]The present specification, page 2, line 6 to page 3, line 10.

[3]The present specification, page 7, lines 8-10.

allowable subject matter, it is respectfully submitted that this application is in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Masayasu Mori
Registration No. 47,301
Attorneys of Record

22850
Tel: (703) 413-3000
Fax: (703) 413-2220
MM:jm
I:\USER\MSMOR\MEW\202834_Ame.wpd

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IN THE CLAIMS

Please amend Claims 1, 7, 11 and 12, and add new Claim 13 as follows:

--1. (Amended) A ground fault interrupter, comprising:

a switch provided in electric lines connecting an electric power source and an electric load;

a zero-phase current transformer configured to detect unbalanced current flowing in the electric lines;

a detection resistor connected in parallel to the zero-phase current transformer and configured to convert current outputted from the zero-phase current transformer to voltage;

a controller configured to determine based on the voltage of the detection resistor whether an electric leak occurs and configured to open the switch when the controller determines that an electric leak occurs; and

at least one filter provided between the detection resistor and the controller and configured to remove high frequency elements in the voltage of the resistor, the at least one filter comprising:

an input side resistor connected in series to the controller and configured to limit current input to the controller; and

a capacitor connected in parallel to the controller,

wherein the ground fault interrupter does not include a clipping circuit between the zero-phase current transformer and the controller.

7. (Amended) A ground fault interrupter according to Claim 5, wherein the at least one filter is configured to cut current having a frequency higher than a frequency of the alternating-current electric source.

11. (Amended) A ground fault interrupter, comprising:

a switch provided in electric lines connecting an electric power source and an electric load;

a zero-phase current transformer configured to detect unbalanced current flowing in the electric lines;

a detection resistor connected in parallel to the zero-phase current transformer and configured to convert current outputted from the zero-phase current transformer to voltage;

a controller configured to open the switch when an electric leak is detected based on the voltage of the detection resistor; and

at least one filter provided between the detection resistor and the controller and configured to remove high frequency elements in the voltage of the resistor, the at least one filter comprising:

an input side resistor connected in series to the controller and configured to limit current input to the controller; and

a capacitor connected in parallel to the controller,

wherein the ground fault interrupter does not include a clipping circuit between the zero-phase current transformer and the controller.

12. (Amended) A ground fault interrupter, comprising:

a switch provided in electric lines connecting an electric power source and an electric load;

zero-phase current transforming means for detecting unbalanced current flowing in

the electric lines;

detection means for converting current outputted from the zero-phase current transforming means to voltage, the detection means being connected in parallel to the zero-phase current transforming means;

controlling means for determining based on the voltage of the detection means whether an electric leak occurs and for opening the switch when the controlling means determines that an electric leak occurs; and

at least one filter means for removing high frequency elements in the voltage of the detection means and provided between the detection means and the controlling means, the at least one filter means comprising:

an input side resistor connected in series to the controlling means and configured to limit current input to the controlling means; and

a capacitor connected in parallel to the controlling means,

wherein the ground fault interrupter does not include a clipping circuit between the zero-phase current transforming means and the controlling means.

13. (New)--